10/530,457
Updated Search
LVCook 5/9/07

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(FILE 'HOME' ENTERED AT 09:40:46 ON 09 MAY 2007)

FILE 'BIOSIS, CAPLUS, EMBASE, MEDLINE, JAPIO' ENTERED AT 09:49:34 ON 09 MAY 2007

L1 0 S (C MANNOSYLTRANFERASE)
L2 8 S (C MANNOSYLTRANSFERASE)
L3 3 DUPLICATE REMOVE L2 (5 DUPLICATES REMOVED)
L4 98 S (C MANNOSYLAT?)
L5 68 S L4 AND PD<2003
L6 2 S L5 AND ANTIBOD?

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     (FILE 'HOME' ENTERED AT 09:40:46 ON 09 MAY 2007)

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     MAY 2007
L1             0 S (C MANNOSYLTRANFERASE)
L2             8 S (C MANNOSYLTRANSFERASE)
L3             3 DUPLICATE REMOVE L2 (5 DUPLICATES REMOVED)
L4            98 S (C MANNOSYLAT?)
L5            68 S L4 AND PD<2003
L6             2 S L5 AND ANTIBOD?

=>
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ANSWER 2 OF 2 MEDLINE on STN

AN 97476276 MEDLINE

DN PubMed ID: 9334252

TI C-Mannosylation of human RNase 2 is an intracellular process performed by a variety of cultured cells.

AU Krieg J; Glasner W; Vicentini A; Doucey M A; Loffler A; Hess D; Hofsteenge J

CS Friedrich Miescher-Institut, P. O. Box 2543, CH-4002 Basel, Switzerland.

SO The Journal of biological chemistry, (1997 Oct 17) Vol. 272, No. 42, pp. 26687-92.
Journal code: 2985121R. ISSN: 0021-9258.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 199711

ED Entered STN: 24 Dec 1997
Last Updated on STN: 24 Dec 1997
Entered Medline: 17 Nov 1997

AB C2-alpha-Mannosyltryptophan was discovered in RNase 2 from human urine, representing a novel way of attaching carbohydrate to a protein. Here, we have addressed two questions related to the biosynthesis of this modification: (i) is C-mannosylation part of the normal intracellular biosynthetic route, and (ii) how general is it, i.e. which organisms perform this kind of glycosylation? To answer the first question, RNase 2, which is identical to the eosinophil-derived neurotoxin, was isolated from intracellular stores of cultured human HL-60 cells. The enzyme was C-mannosylated at Trp-7, showing that the modification occurs intracellularly, before secretion of the protein. The second question was investigated by immunological and chemical analysis of RNase 2 purified from the supernatant of transiently transformed cells from different organisms. This revealed that C -mannosylation occurs in cells from man, green monkey, pig, mouse, and hamster. The observation that pig kidney cells contain the machinery for C-mannosylation of Trp-7 of human RNase 2 but that the homologous RNase from porcine kidney is not a substrate, since it does not contain a tryptophan at position 7, strongly suggests that C-mannosylated proteins other than RNase 2 exist. Recombinant RNase 2 isolated from insect cells, plant protoplasts, and Escherichia coli was not C-mannosylated. These results not only form the basis for further studies on the biochemical aspects of C-mannosylation but also have implications for the choice of cells for production of recombinant glycoproteins.

CT Animals
Antibody Specificity
Cell Line
Cloning, Molecular
Endoribonucleases: GE, genetics
*Endoribonucleases: ME, metabolism
Humans
Mass Spectrometry
Peptide Mapping
Tryptophan: AA, analogs & derivatives
Tryptophan: ME, metabolism

RN 73-22-3 (Tryptophan)

CN 0 (C(2)-mannosyltryptophan); EC 3.1.- (Endoribonucleases); EC 3.1.27.- (ribonuclease U)

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CT Animals
Antibody Specificity
Cell Line
Cloning, Molecular
Endoribonucleases: GE, genetics
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Humans
Mass Spectrometry
Peptide Mapping
Tryptophan: AA, analogs & derivatives
Tryptophan: ME, metabolism

RN 73-22-3 (Tryptophan)

CN 0 (C(2)-mannosyltryptophan); EC 3.1.- (Endoribonucleases); EC 3.1.27.- (ribonuclease U)

=>

ANSWER 3 OF 3 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
DUPLICATE 2
AN 1998:167870 BIOSIS
DN PREV199800167870
TI Protein C-mannosylation is enzyme-catalysed and uses dolichyl-phosphate-mannose as a precursor.
AU Doucey, Marie-Agnes; Hess, Daniel; Cacan, Rene; Hofsteenge, Jan [Reprint author]
CS Friedrich Miescher-Inst., PO Box 2543, CH-4002 Basel, Switzerland
SO Molecular Biology of the Cell, (Feb., 1998) Vol. 9, No. 2, pp. 291-300. print.
CODEN: MBCEEV. ISSN: 1059-1524.
DT Article
LA English
ED Entered STN: 6 Apr 1998
Last Updated on STN: 4 May 1998
AB C-mannosylation of Trp-7 in human ribonuclease 2 (RNase 2) is a novel kind of protein glycosylation that differs fundamentally from N- and O-glycosylation in the protein-sugar linkage. Previously, we established that the specificity determinant of the acceptor substrate (RNase 2) consists of the sequence W-x-x-W, where the first Trp becomes C-mannosylated. Here we investigated the reaction with respect to the mannosyl donor and the involvement of a glycosyltransferase. C-mannosylation of Trp-7 was reduced 10-fold in CHO (Chinese hamster ovary) Lec15 cells, which are deficient in dolichylphosphate-mannose (Dol-P-Man) synthase activity, compared with wild-type cells. This was not a result of a decrease in C-mannosyltransferase activity. Rat liver microsomes were used to C-mannosylate the N-terminal dodecapeptide from RNase 2 in vitro, with Dol-P-Man as the donor. This microsomal transferase activity was destroyed by heat and protease treatment, and displayed the same acceptor substrate specificity as the in vivo reaction studied previously. The C-C linkage between the indole and the mannosyl moiety was demonstrated by tandem electrospray mass spectrometry analysis of the product. GDP-Man, in the presence of Dol-P, functioned as a precursor in vitro with membranes from wild-type but not CHO Lec15 cells. In contrast, with Dol-P-Man both membrane preparations were equally active. It is concluded that a microsomal transferase catalyses C-mannosylation of Trp-7, and that the minimal biosynthetic pathway can be defined as: Man -> GDP-Man -> Dol-P-Man -> (C2-Man-)Trp.
CC Metabolism - Proteins, peptides and amino acids 13012
Enzymes - Physiological studies 10808
Digestive system - Physiology and biochemistry 14004
IT Major Concepts
Metabolism
IT Parts, Structures, & Systems of Organisms
liver microsome
IT Chemicals & Biochemicals
dolichyl-phosphate-mannose synthase; glycosyltransferase; microsomal transferase: activity; C-mannosyltransferase: activity
IT Miscellaneous Descriptors
protein C-mannosylation
ORGN Classifier
Cricetidae 86310
Super Taxa
Rodentia; Mammalia; Vertebrata; Chordata; Animalia
Organism Name
CHO Lec15
Taxa Notes
Animals, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman Mammals, Rodents, Vertebrates
ORGN Classifier
Muridae 86375
Super Taxa

ANSWER 3 OF 3 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
DUPLICATE 2
AN 1998:167870 BIOSIS
DN PREV199800167870
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Digestive system - Physiology and biochemistry 14004
IT Major Concepts
Metabolism
IT Parts, Structures, & Systems of Organisms
liver microsome
IT Chemicals & Biochemicals
dolichyl-phosphate-mannose synthase; glycosyltransferase; microsomal transferase: activity; C-mannosyltransferase: activity
IT Miscellaneous Descriptors
protein C-mannosylation
ORGN Classifier
Cricetidae 86310
Super Taxa
Rodentia; Mammalia; Vertebrata; Chordata; Animalia
Organism Name
CHO Lec15
Taxa Notes
Animals, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman Mammals, Rodents, Vertebrates
ORGN Classifier
Muridae 86375
Super Taxa

Rodentia; Mammalia; Vertebrata; Chordata; Animalia
Organism Name
rat
Taxa Notes
Animals, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman Mammals, Rodents, Vertebrates
RN 62213-44-9 (dolichyl-phosphate-mannose synthase)
9033-07-2 (glycosyltransferase)
9047-61-4 (TRANSFERASE)

=>

Rodentia; Mammalia; Vertebrata; Chordata; Animalia
Organism Name
rat
Taxa Notes
Animals, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman Mammals, Rodents, Vertebrates
RN 62213-44-9 (dolichyl-phosphate-mannose synthase)
9033-07-2 (glycosyltransferase)
9047-61-4 (TRANSFERASE)

=>

ANSWER 2 OF 3 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 1

AN 1999:288375 CAPLUS

DN 131:86723

ED Entered STN: 11 May 1999

TI Recombinant human interleukin-12 is the second example of a C-mannosylated protein

AU Doucey, Marie-Agnes; Hess, Daniel; Blommers, Marcel J. J.; Hofsteenge, Jan

CS Friedrich Miescher-Institut, Basel, CH-4002, Switz.

SO Glycobiology (1999), 9(5), 435-441
CODEN: GLYCE3; ISSN: 0959-6658

PB Oxford University Press

DT Journal

LA English

CC 15-5 (Immunochemistry)
Section cross-reference(s): 7

AB The β-chain of human interleukin 12 (IL-12) contains at position 319-322, the sequence Trp-x-x-Trp. In human RNase 2 this is the recognition motif for a new, recently discovered posttranslational modification, i.e., the C-glycosidic attachment of a mannosyl residue to the side chain of tryptophan. Anal. of C-terminal peptides of recombinant IL-12 (rHuIL-12) by mass spectrometry and NMR spectroscopy revealed that Trp-319β is (partially) C-mannosylated. This finding was extended by in vitro mannosylation expts., using a synthetic peptide derived from the same region of the protein as an acceptor. Furthermore, human B-lymphoblastoid cells, which secrete IL-12, were found to contain an enzyme that carries out the C-mannosylation reaction. This shows that non-recombinant IL-12 is potentially C-mannosylated as well. This is only the second report on a C-mannosylated protein. However, the occurrence of the C-mannosyl-transferase activity in a variety of cells and tissues, and the presence of the recognition motif in many proteins indicate that more C-mannosylated proteins may be found.

ST interleukin 12 tryptophan mannosylation

IT Interleukin 12
RL: PRP (Properties)
(C-mannosylation of)

IT B cell (lymphocyte)
(C-mannosylation of tryptophan residue 319β in human interleukin-12 expressed by cell line for)

IT Animal cell line
(CHO; C-mannosylation of tryptophan residue 319β in human interleukin-12 expressed by)

IT Animal cell line
(NC-37; C-mannosylation of tryptophan residue 319β in human interleukin-12 expressed by)

IT Glycosylation
(mannosidation; of tryptophan residue 319β in human interleukin-12)

IT 229477-64-9, Interleukin-12 C-mannosyltransferase
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence)
(of NC-37 B-cell line)

IT 180509-18-6
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence)
(of human interleukin-12)

IT 73-22-3, Tryptophan, biological studies
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(residue 319β; C-mannosylation of tryptophan residue 319β in human interleukin-12)

RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Bergwerff, A; Eur J Biochem 1998, V253, P560 CAPLUS

ANSWER 2 OF 3 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 1
AN 1999:288375 CAPLUS
DN 131:86723
ED Entered STN: 11 May 1999
TI Recombinant human interleukin-12 is the second example of a C-mannosylated protein
AU Doucey, Marie-Agnes; Hess, Daniel; Blommers, Marcel J. J.; Hofsteenge, Jan
CS Friedrich Miescher-Institut, Basel, CH-4002, Switz.
SO Glycobiology (1999), 9(5), 435-441
CODEN: GLYCE3; ISSN: 0959-6658
PB Oxford University Press
DT Journal
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CC 15-5 (Immunochemistry)
Section cross-reference(s): 7
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ST interleukin 12 tryptophan mannosylation
IT Interleukin 12
RL: PRP (Properties)
(C-mannosylation of)
IT B cell (lymphocyte)
(C-mannosylation of tryptophan residue 319β in human interleukin-12 expressed by cell line for)
IT Animal cell line
(CHO; C-mannosylation of tryptophan residue 319β in human interleukin-12 expressed by)
IT Animal cell line
(NC-37; C-mannosylation of tryptophan residue 319β in human interleukin-12 expressed by)
IT Glycosylation
(mannosidation; of tryptophan residue 319β in human interleukin-12)
IT 229477-64-9, Interleukin-12 C-mannosyltransferase
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence)
(of NC-37 B-cell line)
IT 180509-18-6
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence)
(of human interleukin-12)
IT 73-22-3, Tryptophan, biological studies
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(residue 319β; C-mannosylation of tryptophan residue 319β in human interleukin-12)
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RE
(1) Bergwerff, A; Eur J Biochem 1998, V253, P560 CAPLUS

(2) de Beer, T; Biochemistry 1995, V34, P11785 CAPLUS
(3) Doucey, M; Mol Biol Cell 1998, V9, P291 CAPLUS
(4) Gately, M; Drugs 1996, V52(Suppl 2), P18
(5) Graham, J; Centrifugation: A Practical Approach 1992, P161
(6) Griesinger, C; J Am Chem Soc 1988, V110, P7870 CAPLUS
(7) Gubler, U; Proc Natl Acad Sci USA 1991, V88, P4143 CAPLUS
(8) Hayes, T; Clin Immunol Immunopathol 1997, V83, P1 MEDLINE
(9) Hendrzak, J; Lab Invest 1995, V72, P619 CAPLUS
(10) Hofsteenge, J; Biochemistry 1994, V33, P13524 CAPLUS
(11) Hofsteenge, J; J Biol Chem 1991, V266, P24198 CAPLUS
(12) Hofsteenge, J; Techniques in Protein Chemistry VII 1996, P163 CAPLUS
(13) Krieg, J; J Biol Chem 1997, V272, P26687 CAPLUS
(14) Krieg, J; Mol Biol Cell 1998, V9, P301 CAPLUS
(15) Loffler, A; Biochemistry 1996, V35, P12005 MEDLINE
(16) Pisano, A; Glycobiology 1993, V3, P429 CAPLUS
(17) Rasmussen, J; Curr Opin Struct Biol 1992, V2, P682 CAPLUS
(18) Stern, A; Proc Natl Acad Sci USA 1990, V87, P6808 CAPLUS
(19) Tahara, H; Gene Therapy 1995, V2, P96 CAPLUS
(20) Trinchieri, G; Immunol Today 1994, V15, P460 CAPLUS
(21) Vliegenthart, J; Adv Carbohydr Chem Biochem 1983, V41, P209 CAPLUS
(22) Wilm, M; Anal Chem 1996, V68, P1 CAPLUS
(23) Zitvogel, L; Res Immunol 1995, V146, P628 CAPLUS

(2) de Beer, T; Biochemistry 1995, V34, P11785 CAPLUS
(3) Doucey, M; Mol Biol Cell 1998, V9, P291 CAPLUS
(4) Gately, M; Drugs 1996, V52(Suppl 2), P18
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(9) Hendrzak, J; Lab Invest 1995, V72, P619 CAPLUS
(10) Hofsteenge, J; Biochemistry 1994, V33, P13524 CAPLUS
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(23) Zitvogel, L; Res Immunol 1995, V146, P628 CAPLUS

10/530,457
Search
LYCook 5/9/07

d his

(FILE 'HOME' ENTERED AT 10:47:53 ON 09 MAY 2007)

FILE 'BIOSIS, CAPLUS, EMBASE, MEDLINE, JAPIO' ENTERED AT 10:48:11 ON 09 MAY 2007

L1 8 S (C MANNOSYLTRANSFERASE)
L2 3 DUPLICATE REMOVE L1 (5 DUPLICATES REMOVED)
L3 3 S L2 AND ACTIV?

FILE 'BIOSIS, CAPLUS, EMBASE, MEDLINE, JAPIO' ENTERED AT 10:59:04 ON 09 MAY 2007

L4 4 S (CMT ACTIVIT?)
L5 3 DUPLICATE REMOVE L4 (1 DUPLICATE REMOVED)
L6 356 S (MANNOSYLTRANSFERASE ACTIVI?)
L7 12 S L6 AND ANTIBOD?
L8 5 DUPLICATE REMOVE L7 (7 DUPLICATES REMOVED)
L9 5 S L8 NOT L3
L10 5 S L9 NOT L5
L11 65 S L6 AND SUBSTRAT?
L12 24 S L6 AND MANNOSYLATED
L13 6 S L11 AND L12
L14 3 DUPLICATE REMOVE L13 (3 DUPLICATES REMOVED)

d his

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L9 5 S L8 NOT L3
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L11 65 S L6 AND SUBSTRAT?
L12 24 S L6 AND MANNOSYLATED
L13 6 S L11 AND L12
L14 3 DUPLICATE REMOVE L13 (3 DUPLICATES REMOVED)

ANSWER 2 OF 5 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN

AN 1991:231964 BIOSIS

DN PREV199191123424; BA91:123424

TI PROTEIN O-GLYCOSYLATION IN SACCHAROMYCES-CEREVISIAE PURIFICATION AND CHARACTERIZATION OF THE DOLICHYLPHOSPHATE-D-MANNOSE-PROTEIN O-D-MANNOSYLTRANSFERASE.

AU STRAHL-BOLSINGER S [Reprint author]; TANNER W

CS LEHRSTUHL ZELLBIOLOGIE PFLANZENPHYSIOLOGIE, UNIVERSITAET REGENSBURG, UNIVERSITAETSSTRASSE 31, W-8400 REGENSBURG, W GER

SO European Journal of Biochemistry, (1991) Vol. 196, No. 1, pp. 185-190. CODEN: EJBCAI. ISSN: 0014-2956.

DT Article

FS BA

LA ENGLISH

ED Entered STN: 9 May 1991
Last Updated on STN: 9 May 1991

AB The enzyme dolichyl-phosphate-D-mannose:protein O-D-mannosyltransferase has been solubilized from Saccharomyces cerevisiae membranes and its mannosyltransferase activity demonstrated using short peptides. The specific activity of the protein was enriched 130-fold before it was further purified by native and SDS gel chromatography. A 92-kDa band correlated well with the enzyme activity; an antibody raised against this protein precipitated the mannosyltransferase. The 92-kDa band was hydrolysed to 84 kDa after treatment with endoglycosidase F, indicating that the protein is a glycoprotein which may contain four carbohydrate chains. The purified mannosyltransferase is distinctly influenced in transfer specificity by amino acids next to serine and threonine within the acceptor peptides. Thus acidic amino acids strongly inhibit acceptor activity as do glycine and proline residues as amino-terminal and carboxy-terminal neighbours, respectively.

CC Biochemistry methods - Proteins, peptides and amino acids 10054
Biochemistry studies - Proteins, peptides and amino acids 10064
Biochemistry studies - Carbohydrates 10068
Biophysics - Molecular properties and macromolecules 10506
Enzymes - Methods 10804
Enzymes - Chemical and physical 10806
Metabolism - Carbohydrates 13004
Plant physiology - Enzymes 51518

IT Major Concepts
Biochemistry and Molecular Biophysics; Enzymology (Biochemistry and Molecular Biophysics); Metabolism

IT Miscellaneous Descriptors
EC 2.4.1.109 MOLECULAR SEQUENCE DATA AMINO ACID SEQUENCE CARBOHYDRATE CHAINS

ORGN Classifier
Ascomycetes 15100
Super Taxa
Fungi; Plantae
Taxa Notes
Fungi, Microorganisms, Nonvascular Plants, Plants

ANSWER 2 OF 5 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN

AN 1991:231964 BIOSIS

DN PREV199191123424; BA91:123424

TI PROTEIN O-GLYCOSYLATION IN SACCHAROMYCES-CEREVISIAE PURIFICATION AND CHARACTERIZATION OF THE DOLICHYLPHOSPHATE-D-MANNOSE-PROTEIN O-D-MANNOSYLTRANSFERASE.

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ED Entered STN: 9 May 1991
Last Updated on STN: 9 May 1991

AB The enzyme dolichyl-phosphate-D-mannose:protein O-D-mannosyltransferase has been solubilized from Saccharomyces cerevisiae membranes and its mannosyltransferase activity demonstrated using short peptides. The specific activity of the protein was enriched 130-fold before it was further purified by native and SDS gel chromatography. A 92-kDa band correlated well with the enzyme activity; an antibody raised against this protein precipitated the mannosyltransferase. The 92-kDa band was hydrolysed to 84 kDa after treatment with endoglycosidase F, indicating that the protein is a glycoprotein which may contain four carbohydrate chains. The purified mannosyltransferase is distinctly influenced in transfer specificity by amino acids next to serine and threonine within the acceptor peptides. Thus acidic amino acids strongly inhibit acceptor activity as do glycine and proline residues as amino-terminal and carboxy-terminal neighbours, respectively.

CC Biochemistry methods - Proteins, peptides and amino acids 10054
Biochemistry studies - Proteins, peptides and amino acids 10064
Biochemistry studies - Carbohydrates 10068
Biophysics - Molecular properties and macromolecules 10506
Enzymes - Methods 10804
Enzymes - Chemical and physical 10806
Metabolism - Carbohydrates 13004
Plant physiology - Enzymes 51518

IT Major Concepts
Biochemistry and Molecular Biophysics; Enzymology (Biochemistry and Molecular Biophysics); Metabolism

IT Miscellaneous Descriptors
EC 2.4.1.109 MOLECULAR SEQUENCE DATA AMINO ACID SEQUENCE CARBOHYDRATE CHAINS

ORGN Classifier
Ascomycetes 15100

Super Taxa
Fungi; Plantae

Taxa Notes
Fungi, Microorganisms, Nonvascular Plants, Plants

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AN 1996:40232 BIOSIS
DN PREV199698612367
TI Mannosyltransferase activities in membranes from various yeast strains.
AU Verostek, Mary Frances; Trimble, Robert B. [Reprint author]
CS Wadsworth Cent. C-535, New York State Dep. Health, PO Box 509, Albany, NY 12201-0509, USA
SO Glycobiology, (1995) Vol. 5, No. 7, pp. 671-681.
ISSN: 0959-6658.
DT Article
LA English
ED Entered STN: 26 Jan 1996
Last Updated on STN: 27 Jan 1996
AB In the yeast Golgi compartments, at least five, and potentially several additional mannosyltransferases are involved in elongating to 'mannan' the core Man-8GlcNAc-2 oligosaccharide trimmed from Glc-3Man-9gGlcNAc-2 in the endoplasmic reticulum. Structural studies on oligosaccharides from alg3 mutant yeast, which lack the four upper arm mannoses donated by Man-P-Dol (where Dol is dolichol), verified that the new alpha-1,6-branch in endo H-resistant mannan in this strain is efficiently initiated in vivo on the alpha-1,3-linked core residue of the lipid-oligosaccharide form of Man-5GlcNAc-2 (Verostek et al., J. Biol. Chemical, 266, 5547-5551, 1991). This Man-5GlcNAc-GlcNAc(3H)ol isomer (where GlcNAc(3)ol is N-acetylglucosamin(1-3H)itol) was found to be an excellent acceptor for a number of GDP-Man-dependent Golgi mannosyltransferases in detergent-solubilized yeast membrane preparations: an (alpha-1,3-mannosyltransferase (Mnn1p), an (alpha-1,6-mannosyltransferase (Och1p) and two alpha-1,2-mannosyltransferases (Mnt1p/Kre2p, ?) whose products were readily identified by 1H NMR spectroscopy. The Man-6GlcNAc-GlcNAc(3H)ol isomers formed were easily defined by alpha-1,2-mannosidase sensitivity and either Bio-Gel P-4 gel filtration or AX 5 high-performance liquid chromatography. In general, mannosyltransferases present in detergent-solubilized microsomes from most yeast strains mimicked the array of sugar linkages observed on their respective glycoproteins. However, in the case of the Saccharomyces pmr1 mutant, an alpha-1,3-mannosyltransferase was active in microsomal extracts, but the alpha-1,3-Man epitope could not be identified on Western blots of cellular glycoproteins using sugar linkage-specific antibodies or lectins. The in vitro transferase assay is simple, rapid and accurate, and in the case of pmr1 suggests that in vivo either invertase is misrouted during secretion or the alpha-1,3-mannosyltransferase is mistargeted after its synthesis in this mutant.
CC Cytology - Plant 02504
Genetics - Plant 03504
Biochemistry studies - Proteins, peptides and amino acids 10064
Biochemistry studies - Carbohydrates 10068
Biophysics - Molecular properties and macromolecules 10506
Biophysics - Membrane phenomena 10508
Enzymes - Chemical and physical 10806
Plant physiology - Enzymes 51518
Plant physiology - Metabolism 51519
Plant physiology - Chemical constituents 51522
IT Major Concepts
Biochemistry and Molecular Biophysics; Cell Biology; Enzymology (Biochemistry and Molecular Biophysics); Genetics; Membranes (Cell Biology); Metabolism
IT Chemicals & Biochemicals
MANNOSYLTRANSFERASE; ALPHA-1,2-MANNOSYLTRANSFERASE
IT Miscellaneous Descriptors
ALPHA-1,2-MANNOSYLTRANSFERASE; ALPHA-1,3-MANNOSYLTRANSFERASE; ALPHA-1,6-MANNOSYLTRANSFERASE; ENDOPLASMIC RETICULUM; GLYCOPROTEIN; GOLGI COMPARTMENT; N-LINKED GLYCAN; OLIGOSACCHARIDE
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Organism Name
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Taxa Notes
Fungi, Microorganisms, Nonvascular Plants, Plants
RN 9055-06-5 (MANNOSYLTRANSFERASE)
100041-84-7 (ALPHA-1,2-MANNOSYLTRANSFERASE)

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J. Biol. Chem., Vol. 278, Issue 48, 47724-47730, November 28, 2003

An α-1,3-Mannosyltransferase of *Cryptococcus neoformans**

Ulf Sommer‡, Hong Liu, and Tamara L. Doering§

From the Department of Molecular Microbiology, Washington University Medical School, St. Louis, Missouri 63110

Cryptococcus neoformans is a pathogenic fungus, distinguished by an elaborate polysaccharide capsule that is essential for its virulence. As part of an effort to understand the biosynthesis of this important structure, we initiated purification of an α-1,3-mannosyltransferase with appropriate specificity for a role in building the main capsule polysaccharide, glucuronoxylomannan. A pool of proteins that was 5,000-fold enriched in this activity included several polypeptides, which acted potentially as the catalytic protein. These were analyzed using sequence information and double-stranded RNA interference. Interference that targeted a sequence corresponding to part of a 46 kDa protein in the enriched fraction abolished the activity of interest and reduced the capsule on the affected cells. This gene was cloned and expressed in active form in *Saccharomyces cerevisiae* to confirm function, and was termed *CMT1*, for cryptococcal mannosyltransferase 1. *CMT1* has no confirmed homologs in GenBank™ other than *CAP59*, a cryptococcal gene encoding a protein of unknown function that is required for capsule synthesis and virulence. The Cmt1p protein also co-purifies with a homolog of *CAP64*, a gene whose product has similarly been implicated in capsule synthesis and virulence. A strain disrupted in *CMT1* was generated in *C. neoformans*; this had no effect on virulence in an animal model of cryptococcosis.

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The Pathogenic Fungus Cryptococcus neoformans Expresses Two Functional GDP-Mannose Transporters with Distinct Expression Patterns and Roles in Capsule Synthesis
Eukaryot. Cell, May 1, 2007; 6(5): 776 - 785.
[Abstract] [Full Text] [PDF]

EUKARYOTIC CELL ▸HOME

O. W. Liu, M. J. S. Kelly, E. D. Chow, and H. D. Madhani
Parallel {beta}-Helix Proteins Required for Accurate Capsule Polysaccharide Synthesis and Virulence in the Yeast Cryptococcus neoformans
Eukaryot. Cell, April 1, 2007; 6(4): 630 - 640.
[Abstract] [Full Text] [PDF]

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Y. C. Chang, A. Jong, S. Huang, P. Zerfas, and K. J. Kwon-Chung
CPS1, a Homolog of the Streptococcus pneumoniae Type 3 Polysaccharide Synthase Gene, Is Important for the Pathobiology of Cryptococcus neoformans
Infect. Immun., July 1, 2006; 74(7): 3930 - 3938.
[Abstract] [Full Text] [PDF]

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C. L. Griffith, J. S. Klutts, L. Zhang, S. B. Levery, and T. L. Doering
UDP-glucose Dehydrogenase Plays Multiple Roles in the Biology of the Pathogenic Fungus Cryptococcus neoformans
J. Biol. Chem., December 3, 2004; 279(49): 51669 - 51676.
[Abstract] [Full Text] [PDF]

EUKARYOTIC CELL ▸HOME

F. Moyrand, Y. C. Chang, U. Himmelreich, K. J. Kwon-Chung, and G. Janbon
Cas3p Belongs to a Seven-Member Family of Capsule Structure Designer Proteins
Eukaryot. Cell, December 1, 2004; 3(6): 1513 - 1524.
[Abstract] [Full Text] [PDF]

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F. Moyrand and G. Janbon

UGD1, Encoding the Cryptococcus neoformans UDP-Glucose Dehydrogenase, Is Essential for Growth at 37{degrees}C and for Capsule Biosynthesis

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